

**Gallatin County Planning Board
Infrastructure Committee
Water and Wastewater Subcommittee
Record of Meeting: July 7, 2008**

Members present: C.B. Dormire (Subcommittee Chair); Gail Richardson; Don Seifert; Kerry White; Sean O'Callaghan, County Planning Department.

Guest: Robert Seamons, from Stahly Engineering

1. Call to Order: 4:05

2. Approval of June 23, 2008 Meeting Minutes: Approved 3:0

Sean noted that he went to the American Public Works Association website but could not access any of the information that Steve Klotz had referenced at the previous meeting. Robert suggested looking for information from the American Water Works Association, American Society of Civil Engineering, and National Society of Professional Engineers. Robert offered to round up some information for the group.

3. Discussion with Robert Seamons, from Stahly Engineering regarding Manhattan Wastewater Treatment Plant:

Robert: Gave a handout that outlined his presentation and gave an overview of Manhattan's wastewater treatment plant. Stahly designed the plant and is currently operating it on a contract basis.

He described the workings of Manhattan's plant and their use of equalization. Equalization uses a holding tank to dose inflow into the treatment system so that there are not peaks or surges in input. The equalization tanks allow the plant to operate appropriately when the inflows are below the design flows (25% or more). A fairly uniform flow to the plant is important to the efficiency and health of the microorganisms used in treatment.

UV disinfection is being used, and the plant is designed so hydrogen peroxide can be added at approximately 10 parts per million to treat micro-pollutants (pharmaceuticals, bacterial, viral, etc., but not organic chemical). Hydrogen peroxide must be added prior to UV treatment for this to work.

Dried sludge is currently being disposed at the Logan landfill, but as town grows, could be composted. This is inert material before it is disposed of.

Manhattan's plant is classified as a biological nutrient removal (BNR) plant, this is the first in the State to use biowheels, but there are probably 50 others in the U.S. The microorganisms used in the plant are self-generating. The microorganisms can be harmed by

certain compounds such as copper, so Manhattan has a pre-treatment ordinance. The plant does not accept septic tank pumpage, a conscious decision based on experience at Big Sky.

Robert expressed a concern about communities that are building aerated ponds now because they convert ammonia into nitrates, but they don't remove them. Manhattan's plant currently converts 75% of the nitrates into nitrogen gas which is released into the atmosphere.

Robert estimated the cost of adding hydrogen peroxide to Manhattan's wastewater treatment regiment would be about \$2,500 a month, but would require approval from DEQ. He estimated annual operation cost of the plant at about \$100,000.

Robert discussed the importance of aeration in wastewater treatment and described the use of the "biowheel", which was first considered experimental by DEQ. Biowheels are approximately 20 feet wide and 15 feet in diameter. They trap air as they rotate and release the air at the bottom of rotation to provide for aeration. The surface of the biowheel also becomes coated with nitrogen removing bacteria. Manhattan has six biowheels, three per tank. Biowheels move at approximately 0.7 rotations per minute, 0.3 rpm is the minimum. Life expectancy of the wheels is estimated to be approximately 20 years.

Robert discussed why Manhattan is not trying to capture methane from wastewater inflows and described in general terms that the volume of the gas that could be captured at the plant is not sufficient. Generating hydropower also isn't practical for Manhattan, but suggested looking at Las Vegas' generation of hydropower with their treated wastewater at Lake Mead.

Plant occupies approximately 1.5 acres of a 4-acre parcel off of Nixon Gulch Road. Everything is gravity fed to the system.

The plant has been up and running for about 45 days now. The initial treatment samples reveal that they are greatly exceeding DEQ minimum treatment standards. Manhattan discharges treated effluent to an irrigation ditch (Dida Ditch).

They must do testing several times a week and prepare a monthly report to DEQ. DEQ shows up a couple of times a year un-announced to take samples.

Total cost of project was approximately 6.1 million dollars. Manhattan spent approximately 1.5 million dollars extra to make it so the plant was easily expandable to accommodate future growth. Robert estimates that the plant could be built for less money right now do to the slow down in the economy. Manhattan received approximately \$2.5 million dollars in grants to build the system.

Manhattan's biowheels were actually less money than building for traditional aeration. Manhattan's plant performance currently exceeds DEQ minimum standards.

The plant is designed for 400,000 gallons per day of inflow and is currently running between 150,000 – 175,000 gallons per day.

For existing communities with existing discharge permits, it would take approximately four years to design, permit, bid, and build a similar plant.

When asked about using this type of wastewater treatment system for smaller-scale applications, Robert stated that a similar system is being used to treat 10,000 gpd at a Navajo School in New Mexico. Robert is looking at building a similar system for Bridger Pines subdivision.

Three Forks has a series of lagoon ponds that are leaking, and explored a wetlands-type wastewater treatment system as a potential solution. Robert doesn't think it would work well and suggested they explore mechanical treatment.

Robert isn't very familiar with Bozeman's situation, but thinks that they would need, at a minimum, membranes in the clarifiers to make a system like this work. He thinks that Bozeman should be looking at re-use of water.

Grand Targhee has a membrane system, and one has been designed and approved (but not yet built) for Moonlight Basin. Membranes add a 100% barrier to suspended solids (and bugs, but not chemicals) so you get a higher level of treatment. Phosphorus, nitrates, and ammonia can be removed through reverse osmosis.

Robert volunteered to perform some calculations to determine the technical and economic feasibility of using this type of system at various scales.

The maintenance and operational requirements of this system are similar in terms of energy use to a Utility Solutions. It takes a full time operator to perform sampling and monitoring work etc. Robert thinks that the total operation cost is less than other types of treatment technologies.

Robert doesn't think that having Homeowner's Associations responsible for monitoring and maintenance of wastewater treatment systems is likely to be effective. They don't have technical expertise to run the system and if they get out of compliance it can become a federal issue.

Robert discussed the feasibility of one operator running several of these small systems and suggested talking to David King, the operator of the Rae wastewater treatment plant. He suggested that rather than having several small systems, several subdivisions could be hooked up and pump to one central treatment site.

4. **Member Reports:** No members had anything to report. The draft report from the legislative interim committee was handed out.
5. **Board Discussion of Further Consulting Engineering Study:** Discussion on this item was delayed to the next meeting.

- 6. Next meeting Date and Agenda:** Nobody is lined up for the next meeting on July 21st. Don will try to get somebody from Three Forks and will visit with David King from Rae and Debbie Arkell from the City of Bozeman.
- 7. Other Business:** Robert's handout and the report from the Water Policy Interim Committee were made exhibits.
- 8. Adjourn:** 6:10